

(e) a separate, independent overrunning clutch means operatively connected to each wheel(s) on the second end of the frame for allowing each wheel(s) on the second end of the frame to independently overrun the hydraulic motor(s) driving such wheel(s) when required during turns of the vehicle.

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~~38~~. A vehicle as recited in claim ²⁴~~35~~, wherein a pair of wheels are provided on the second end of the frame, wherein a single hydraulic motor is used to drive the pair of wheels carried on the second end of the frame through a solid axle, and wherein the independent overrunning clutch means comprises a clutch operatively connected between each end of the axle and a wheel hub of each wheel carried on the second end of the frame.--

Supplemental Remarks

Arguments as to Claim 9

Independent claim 9 is directed to a riding mower having a tricycle configuration with a pair of front wheels and a single rear wheel. The claimed hydraulic drive system set forth in claim 9 as amended herein further requires that

"the wheel drive motor for the rear wheel is connected in series to the fluid source and to the wheel drive motors for the front wheels in a manner that causes the pressurized fluid flow to pass substantially in its entirety through the wheel drive motor for the rear wheel to provide a maximum tractive effort on the rear wheel for a given pressurized fluid flow regardless of wheel slippage conditions on the front wheels."

(Emphasized language is subject matter newly added to the claim in the above section entitled Supplemental Amendment).

Benko does not disclose or suggest this subject matter. In Benko, the drive motor for the rear wheel 26 is connected in parallel to the drive motors for the front wheels 16. Thus, the pressurized fluid flow that is provided to the wheel drive motors at any give time is split between all three wheel drive motors 48. If one or more of the front wheel drive motors starts to slip, the system will supply more fluid to the slipping front wheel drive motors, thus diverting fluid and tractive effort from the rear wheel drive motor. This is exactly the reverse of what the claimed invention involves and, in fact, is the very problem the claimed invention solves. Benko simply does not connect the rear wheel drive motor in any manner "that causes the pressurized fluid flow to pass substantially in its entirety through the wheel drive motor for the rear wheel to provide a maximum tractive effort on the rear wheel for a given pressurized fluid flow regardless of wheel slippage conditions on the front wheels."

Arguments as to Claims 11, 22 and 34

Claim 11 is ultimately dependent from independent claim 9. In the Applicants' invention, the wheel which is serially connected and which receives the maximum tractive effort from the pressurized fluid flow, namely the rear wheel in claim 9, is chosen to be that wheel which is beneath the engine carried on the frame. Thus, in addition to receiving the maximum tractive effort from the

pressurized fluid flow by virtue of the serial connection, the rear wheel further receives the beneficial traction provided by the weight of the engine above it. The weight of the engine is, in effect, constantly pushing down on the rear wheel, which wheel is also simultaneously receiving the entire pressurized fluid flow. This contributes to the ability of the mower to keep the rear wheel from slipping.

Assuming arguendo that claim 9 was shown or would be obvious in view of Benko, i.e. that Benko's hydraulic drive system could be completely redesigned such that the drive motor for the rear wheel 26 was serially connected to the pressurized fluid flow while the front wheel drive motors were connected in parallel to the fluid flow, Benko does not teach or suggest that the engine be additionally located above this particular wheel. In Benko, the engine is carried above the two front wheels that would still be connected to the fluid source in parallel in this modification of Benko. Thus, the engine in Benko would not additionally provide tractive effort on the rear wheel of Benko even if Benko's rear wheel 26 were driven by a wheel drive motor that received the entire pressurized fluid flow. Accordingly, claim 11 is further allowable in requiring an "engine... mounted on the rear of the frame generally above the rear wheel."

Claim 22, ultimately dependent from independent claim 20, is allowable for the same reasons.

Arguments as to Claims 20 and 26

Independent claim 20 is directed to a riding mower having a pair of front wheels and at least one rear wheel. Thus, unlike claim 9, claim 20 is not specifically directed to a tricycle configuration, but would cover configurations

having more than three drive wheels. The claimed hydraulic drive system set forth in claim 20 as amended herein further requires that

"the wheel drive motor(s) for the rear wheel(s) being connected in series to the fluid source and to the wheel drive motors for the front wheels in a manner that causes the pressurized fluid flow to pass substantially in its entirety through each wheel drive motor for each rear wheel to provide a maximum tractive effort on each rear wheel for a given pressurized fluid flow regardless of wheel slippage conditions on the front wheels".

(Emphasized language is subject matter newly added to the claim in the above section entitled Supplemental Amendment).

Independent claim 26 is directed to a turf maintenance vehicle instead of a riding mower, and would in addition to covering riding mowers also cover other similar vehicles, such as sand trap grooming vehicles, aerating vehicles, or the like. In addition, in claim 26, the serially connected wheel or wheels can be on either end of the frame as opposed to simply being on the rear end, with the parallel connected pair of drive wheels being on the other end of the frame. Nonetheless, even with these changes, claim 26 still recites the following:

"the wheel drive motor(s) for the wheel(s) on the second end of the frame being connected in series to the fluid source and to the wheel drive

motors for the wheels on the first end of the frame in a manner that causes the pressurized fluid flow to pass substantially in its entirety through each wheel drive motor for each wheel on the second end of the frame to provide a maximum tractive effort on each wheel on the second end of the frame for a given pressurized fluid flow regardless of wheel slippage conditions on the wheels on the first end of the frame".

(Emphasized language is subject matter newly added to the claim in the above section entitled Supplemental Amendment).

Benko does not disclose or suggest this subject matter. The arguments made above with respect to claim 9 apply equally to both claim 20 and 26 as well.

For example, with respect to claim 20, Benko simply does not connect his rear wheel drive motor in any manner "that causes the pressurized fluid flow to pass substantially in its entirety through each wheel drive motor for each rear wheel to provide a maximum tractive effort on each rear wheel for a given pressurized fluid flow regardless of wheel slippage conditions on the front wheels."

With respect to claim 26, Benko simply does not connect any of the drive wheels on either end of his frame in any manner "that causes the pressurized fluid flow to pass substantially in its entirety through each wheel drive motor for each wheel on the second end of the frame to provide a maximum tractive effort on each wheel on the second end of the frame for a given pressurized fluid flow regardless of wheel slippage conditions on the wheels on the first end of

the frame." Thus, whether the first end of the frame is the front end and the second end of the frame is the rear end, or vice versa, Benko does not teach or suggest this subject matter set forth in claim 26.

Arguments as to New Claim 35

New claim 35, like claim 26, is directed to a turf maintenance vehicle. It is broader than claim 26 in that it does not require individual wheel drive motors for each wheel on the second end of the frame, but would cover an arrangement in which only one wheel drive motor powers multiple wheels on the second end of the frame. However, new claim 35 still recites the basic nature of the hydraulic drive system of this invention, namely the serial connection to however many drive motors might be on the second end of the frame along with the parallel connection to the pair of individually driven wheel motors for the pair of wheels on the first end of the frame. For example, claim 35 recites:

"the wheel drive motor(s) for the wheel(s) on the second end of the frame being connected in series to the fluid source and to the wheel drive motors for the wheels on the first end of the frame in a manner that causes the pressurized fluid flow to pass substantially in its entirety through each wheel drive motor for the wheel(s) carried on the second end of the frame to provide a maximum tractive effort on each wheel on the second end of the frame for a given pressurized fluid flow regardless of wheel slippage conditions on the wheels on the first end of the frame; and

the wheel drive motors for the wheels on the first end of the frame being connected to each

other in parallel in a manner that causes the pressurized fluid flow to be split when passing through the wheel drive motors for the wheels on the first end of the frame."

Benko does not disclose or suggest this subject matter for the reasons set forth above in discussing claims 9, 20 and 26. The all parallel connection of his drive wheels does not comprise the unique serial/parallel connections set forth in this portion of the claim. And neither does any of the other prior art of record. For example, in the Reelmaster 3500-D product, the drive to either pair of the front wheels or the rear wheels is a single motor driving a transaxle that provides the necessary differential action. There are no individual wheel drive motors on either end of the frame that are connected together in parallel to one another.

Claim 35 is further allowable by virtue of reciting the overrunning clutch means that allows the rear wheels to overrun during turns. Such clutch means are used whether individual wheel drive motors are applied to each wheel or a pair of wheels are driven by one wheel drive motor. This latter alternative is specifically set forth in the specification on page 13, Lines 15-30. Thus, Claim 35 also requires:

"a separate, independent overrunning clutch means operatively connected to each wheel(s) on the second end of the frame for allowing each wheel(s) on the second end of the frame to independently overrun each other and the hydraulic motor(s) driving such wheel(s) when required during turns of the vehicle."

Benko does not disclose or suggest this subject matter. His all parallel connection of his wheel drive motors needs no overrunning clutch means since the hydraulic supply system provides a natural differential action. Moreover, the recited overrunning clutch means is not found in the Reelmaster 3500-D product either. Only a single such clutch is found in this product between the output shaft of the single wheel drive motor and the input shaft of a transaxle. The transaxle still provides the differential action as between the two wheels. In the recited claim language, a separate, independent overrunning clutch means is operatively connected to each wheel(s) on the second end of the frame for allowing each wheel(s) on the second end of the frame to independently overrun the hydraulic motor(s) driving such wheel(s).

Summary

It is believed that the previously stated objections of Examiner Melius to the Amendment of July 10, 1995 have been overcome. The specific language of each independent claim has been reviewed to show how each of these claims patentably distinguishes over Benko and the other art of record. In addition, at least some of the dependent claims have been discussed to show how such dependent claims further distinguish over Benko. Accordingly, for all the reasons noted above, this application is believed to be in condition for allowance. It is respectfully requested that

this application be allowed and sent to issue.



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Certificate under 37 C.F.R. 1.8. I hereby certify that this Supplemental Amendment And Supplemental Remarks and all papers described in or accompanying this document are being deposited with the U.S. Postal Service, as First Class Mail, in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on October 5, 1995.